PATENT/OFFICIAL

Docket No. 008066 USA/PMG/PCTRL

1 1 2004 EIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Susie Xiuru YANG et al.

Serial No. 10/809,908

Group Art Unit: 2812

Filed: March 26, 2004

Examiner:

For:

IMPROVED CONTROL OF METAL RESISTANCE IN SEMICONDUCTOR

PRODUCTS VIA INTEGRATED METROLOGY

## SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the documents listed on the attached form PTO-1449. It is respectfully requested that the documents be expressly considered during the prosecution of this application, and that the documents be made of record therein and appear among the "References Cited" on any patent to issue therefrom. Copies of any cited U.S. Patents and U.S. Patent Publications are not being submitted in accordance with 37 CFR 1.98(a)(2)(i).

This Information Disclosure Statement is being filed within three months of the U.S. filing date OR before the mailing date of a first Office Action on the merits. No certification or fee is required.

In accordance with 37 C.F.R. § 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search had been made or that information cited is, or is considered to be, material to patentability as defined in 37 C.F.R.§ 1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless otherwise indicated, the date of

## Serial No. 10/809,908

publication indicated for an item is taken from the face of the item, and Applicant reserves the right to prove that the date of publication is in fact different.

No fee is believed to be required; however, the Commissioner is authorized to charge any deficiency in any fees pursuant to 37 CFR § 1.17 associated with this communication and to credit any excess payment to Deposit Account No. 08-0219.

Respectfully submitted,

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Date: 8/11/04

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INFORMATION DISCLOSURE CITATION IN AN APPLICATION (PTO-1449)	ATTY. DOCKET NO. 008066 USA/ PMG/PCTRL	SERIAL NO. 10/809,908		
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EXAMINER'S INITIALS	PATENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE	
	4,957,605	09/18/90	Hurwitt et al.			04/17/89	
	5,240,552	08/31/93	Yu et al.			12/11/91	
	5,369,544	11/29/94	Mastrangelo			04/05/93	
	5,444,837	08/22/95	Bomans et al.			12/29/93	
	5,665,214	09/09/97	Iturralde			05/03/95	
	5,695,810	12/09/97	Dubin et al.			11/20/96	
	5,824,599	10/20/98	Schacham-Diamand et al.			01/16/96	
	5,825,356	10/20/98	Habib et al.		. ,	03/18/96	
	5,831,851	11/03/98	Eastburn et al.			03/21/95	
	5,838,951	11/17/98	Song			08/28/96	
	5,859,777	01/12/99	Yokoyama et al.			05/13/97	
<del></del>	5,871,805	02/16/99	Lemelson			04/08/96	
	5,943,550	08/24/99	Fulford, Jr. et al.			03/29/96	
	6,012,048	01/04/00	Gustin et al.			05/30/97	
	6,037,664	03/14/00	Zhao et al.			03/31/98	
	6,059,636	05/09/00	Inaba et al.			07/09/98	
	6,096,649	08/01/00	Jang			10/25/99	
	6,100,195	08/08/00	Chan et al.			12/28/98	
	6,114,238	09/05/00	Liao			05/20/98	
	6,150,270	11/21/00	Matsuda et al.			01/07/99	
<del></del>	6,157,864	12/05/00	Schwenke et al.			05/08/98	
	6,181,013 B1	01/30/01	Liu et al.			03/13/00	
	6,212,961 B1	04/10/01	Dvir		-	02/11/99	
	6,226,563 B1	05/01/01	Lim			09/04/98	
	6,228,280 B1	05/08/01	Li et al.		<del></del>	05/06/98	
	6,237,050 B1	05/22/01	Kim et al.			09/04/98	
	2001/0006873 A1	07/05/01	Moore			02/13/01	
	6,259,160 B1	07/10/01	Lopatin et al.			04/21/99	
"	6,281,127 B1	08/28/01	Shue			04/15/99	
KAMINER			DATE CONSIDE	RED		L	

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## ATTY. DOCKET NO. SERIAL NO. INFORMATION DISCLOSURE 008066 USA/ 10/809,908 CITATION IN AN PMG/PCTRL **APPLICATION** (PTO-1449) APPLICANT Susie Xiuru YANG et al. FILING DATE GROUP March 26, 2004 2812 **U.S. PATENT DOCUMENTS** EXAMINER'S FILING **INITIALS** PATENT NO. DATE NAME **CLASS SUBCLASS** DATE 6,317,643 B1 11/13/01 Dmochowski 03/31/99 6,339,727 B1 01/15/02 Ladd 12/21/98 6,355,559 B1 03/12/02 Havemann et al. 11/03/00 6,391,780 B1 05/21/02 Shih et al. 08/23/99 07/09/02 6,417,014 B1 Lam et al. 10/19/99 6,427,093 B1 07/30/02 Toprac 10/07/99 08/13/02 6,432,728 B1 Tai et al. 10/16/00 09/10/02 Miller et al. 6,449,524 B1 01/04/00 6,455,415 B1 09/24/02 Lopatin et al. 04/16/01 2002/0165636 A1 11/07/02 Hasan 04/24/02 6,484,064 B1 11/19/02 Campbell 10/05/99 6,495,452 B1 12/17/02 Shih 08/18/99 2002/0193899 A1 12/19/02 Shanmugasundram et al. 05/01/02 2003/0017256 A1 01/23/03 Shimane 06/12/02 6,515,368 B1 02/04/03 12/07/01 Lopatin et al. 6,517,414 B1 02/11/03 Tobin et al. 03/10/00 03/04/03 6,528,409 B1 Lopatin et al. 04/29/02 6,537,912 B1 03/25/03 Agarwal 08/25/00 6,580,958 B1 06/17/03 Takano 11/22/99 6,605,549 B2 08/12/03 Leu et al. 09/29/01 6,607,976 B2 08/19/03 09/25/01 Chen et al. 6,609,946 B1 08/26/03 Tran 07/14/00 6,616,513 B1 09/09/03 Osterheld 04/05/01 6,624,075 B1 09/23/03 Lopatin et al. 11/05/02 6,630,741 B1 10/07/03 Lopatin et al. 12/07/01 12/09/03 6,660,633 B1 Lopatin et al. 02/26/02 6,708,074 B1 03/16/04 Chi et al. 08/11/00 6,708,075 B2 03/16/04 Sonderman et al. 11/16/01 6,728,587 B2 04/27/04 Goldman et al. 12/27/00 **EXAMINER** DATE CONSIDERED

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INFORMATION DISCLOSURE			SURE	ATTY. DOCKET NO. SERIAL NO.				
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		FOR	EIGN PATENT	DOCUMENTS				
EXAMINER'S INITIALS	DATENT NO	D. 4 7777	COLINERY		CLASS	SUBCLASS	Translation	
INITIALS		DATE		UNTRY CLAS			Yes No	
ļ		07/28/99	EP				X	
ļ	EP 1 083 470 A2	03/14/01				-	X	<u> </u>
	<u></u>	<u> </u>	EP	<u> </u>		<u> </u>		ļ
	GB 2 365 215 A	02/13/02	GB				X	
				tle, Date, Pertinent		14		
	Sun, S.C. 1998. " <i>IEEE</i> . pp. 243-246		Transition Meta	l Nitrides as Diffusion	on Barriers	for Cu Metalli	zation.	,,
			ra, and Y. Hayas	hi. 1999. "Layered	Ta-nitride	s (LTN) Barrie	r Film l	by
				CVD-Cu Damascen				
				H. Bender, T. Noga				SEM
				nless I-PVD TA(N) 200. San Diego, CA		Dual Damascen	e''	
				Katharine Dovidenko		n Kaloveros 2	001	
				sed Materials for Ze				
	Applications" (Abs	stract). IEEE.	pp. 207-209.					
				d K. Pfeifer. 2001.				
	Characterization of ALD Tin Used as a Copper Diffusion Barrier in 0.25 mum, Dual Damascene Backend Structures" (Abstract). Advanced Metallization Conference 2001. Montreal, Quebec.							
	Kim VT and H S	Sim 2002 "C	haracteristics of	Pulse Plasma Enhan	ntreal, Que	bec.	ion of	
				rconnect" (Abstract				
	No. 178, pp. 115-1			(11001111)	,			,
	Elers, Kai-Erik, Vil	lle Saanila, Pek	ka J. Soininen, V	Vei-Min Li, Juhana	Γ. Kostamo	o, Suvi Haukka	, Jyrki	
				n Barrier Deposition			Atomic	;
				s. Vol. 14, No. 13-1				LMC
				I. Tsai, M.W. Lin, C Damascene Technolo				
	pp. 603-606.	omi Generatio	copper Duar I	ramascene recinion	ъј мин Ан	Tari Darric	. ILL	. س
		, Y. Zhu, E. Ei	senbraun, and A.	Kaloyeros. 2002.	'Thermal a	nd Electrical B	arrier	
	Performance Testin	g of Ultrathin	Atomic Layer De	eposition Tantalum-l				opper
	Metallization." IEI			<u> </u>				
				Chen, G.J. Wang, Y				, and
				Cu Damascene Inter " IEEE. pp. 595-59		viui PECVD SI	ncon	
	July 25, 2003. Inte				<u>.                                    </u>			
	March 30, 2004. W				<del>-</del>			
	April 9, 2004. Writ	<u>_</u>			· · · · · · · · · · · · · · · · · · ·	<u></u> .		
	-			09/998,372, filed No	vember 30	2001		
EXAMINER	три 22, 200т. Оп	- Tellon IOI		ATE CONSIDERED		, 2001.		
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## ATTY. DOCKET NO. SERIAL NO. INFORMATION DISCLOSURE 008066 USA/ 10/809,908 CITATION IN AN PMG/PCTRL **APPLICATION** (PTO-1449) APPLICANT Susie Xiuru YANG et al. FILING DATE GROUP 2812 March 26, 2004 OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.) April 28, 2004. Written Opinion for PCT/US02/19117. April 29, 2004. Written Opinion for PCT/US02/19061. May 5, 2004. Office Action for U.S. Serial No. 09/943,955, filed August 31, 2001. May 5, 2004. International Preliminary Examination Report for PCT/US01/27406. May 28, 2004. Office Action for U.S. Serial No. 09/943,383, filed August 31, 2001. June 3, 2004. Office Action for U.S. Serial No. 09/928,474, filed August 14, 2001. June 23, 2004. Office Action for U.S. Serial No. 10/686,589, filed October 17, 2003. June 30, 2004. Office Action for U.S. Serial No. 09/800,980, filed March 8, 2001. July 12, 2004. Office Action for U.S. Serial No. 10/173,108, filed June 8, 2002. EXAMINER DATE CONSIDERED